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Obesity Reduction in Older Adults: Does Exercise Modality Matter?

Robert Ross

PhD, FACSM, FAHA School of Kinesiology and Health Studies Medicine, Division of Endocrinology and Metabolism Queen's University Kingston, Ontario, Canada

Faculty/Presenter Disclosure

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Bias declaration is that:

Body weight is not a good primary outcome for strategies designed to manage obesity and related health risks.

Health Risk



Public interpretation for obesity management? Weight Loss is required No weight loss is a failure

Body Mass Index

Optimal Weight Loss Recommendations

Adults

Increase risk



Appropriate Physical Activity Intervention Strategies for Weight Loss and Prevention of Weight Regain for Adults

POSITION STAND

AMERICAN COLLEGE

of SPORTS MEDICINE

This pronouncement was written for the American College of Sports Medicine by Joseph E. Donnelly, Ed.D. (Chair); Steven N. Blair, PED; John M. Jakicic, Ph.D.; Melinda M. Manore, Ph.D., R.D.; Janet W. Rankin, Ph.D., and Bryan K. Smith, Ph.D.

Clinically significant weight loss = greater than 5%

Less than 3% = weight maintenance



Decrease risk

Body Mass Index

Does Successful Obesity Management Require Weight Loss?



Body Mass Index

Obesity Management – Desired Outcomes Decrease total adiposity Decrease abdominal adiposity Maintain/increase lean mass Decrease functional limitation Improve Cardiorespiratory Fitness Decrease cardiometabolic risk factors

Obese Elderly: The Merging of Two Epidemic Trends



Issues with aging



3.4 mg/kg/min 7.5 mg/kg/min Insulin Sensitivity

Functional Fitness 30% less



Preventing and Treating Skeletal Muscle Loss Exercise Modality

Skeletal Muscle in Athletes and Sedentary Controls by Age



H. Klitgard et al., Acta Phsyiol Scand 1990;140:41-54

Preventing and Treating Sarcopenia

Muscle Hypertrophy in Response to a Laboratory-Based Strength Training Program



W.R. Frontera et al., J Appl Physiol 1988;64:1308-44

Decreasing Health Risk and Improving Functional Capacity in Older Adults

Which modality of exercise is optimal?



Which modality is optimal for decreasing abdominal obesity, insulin resistance and increasing functional capacity?

Effects of Exercise Modality on Insulin Resistance and Functional Limitation in Older Adults

A Randomized Controlled Trial

Lance E. Davidson, PhD; Robert Hudson, MD, PhD; Katherine Kilpatrick, MD; Jennifer L. Kuk, PhD; Kathleen McMillan, MSc; Peter M. Janiszewski, MSc; SoJung Lee, PhD; Miu Lam, PhD; Robert Ross, PhD



Effects of Exercise Modality on Insulin Resistance and Functional Capacity in Aging: A Randomized Controlled Trial

Treatment Groups



Abdominally Obese Men and Women (Age ~68yrs) : 6 month exercise intervention, *without caloric restriction*.

Davidson et al. Arch Intern Med 169(2): 122-131, 2009.

Testing Protocol Recruit VO₂max VO₂max VO₂max FFT FFT FFT FFT Consent MRI MRI Clamp Clamp 6-month intervention Dietary run-in OGTT period (3-4 wks)



C: Normal lifestyle



RE: Weights

3x/wk

AE: Treadmill

5x/wk



RAE: Weights 3x/wk + Treadmill 3x/wk

Visceral Fat, Skeletal Muscle, and Insulin Resistance







Hyperinsulinemic Euglycemic Clamp



Anthropometrics

- Height
- Weight
- Skinfolds
 - 7-site
- Circumferences
 - Abdominal
 - Appendicular



Cardiorespiratory and functional fitness

Maximal graded exercise test (VO2max)



Functional fitness tests



Chair stands Arm curls 2-minute step 8-foot up and go







Effects of Exercise Modality on Cardiorespiratory Fitness in Older Men and Women



Effect of Fatness (BMI) and Fitness on Cardiovascular Disease (CVD) Mortality *Wei M et al. JAMA 1999; 282:1547-53*



"Fit" – top 80 percent – 30 minutes per day of physical activity

Metabolic Syndrome, Fitness, and Mortality

Katzmarzyk et al. Arch Intern Med 2004;164: 1092-7.

CVD Mortality Among 19,223 Men from the Aerobics Center Longitudinal Study: 10 Years of Follow-up



"Fit" – top 80 percent ~ 30 minutes per day of physical

Effects of Exercise Modality on Body Weight and Waist Circumference in Older Men and Women



Effects of Exercise Modality on Visceral Fat, Total Fat and Skeletal Muscle in Older Men and Women



Exercise Modality on Skeletal Muscle Mass in Older Adults



Davidson et al. Arch Intern Med 169(2): 122-131, 2009.

Effects of Exercise Modality on Insulin Sensitivity in Older Men and Women



Effects of Exercise Modality on Functional Limitation in Older Men and Women



Effects of Exercise Modality on Insulin Resistance and Functional Capacity in Aging: A Randomized Controlled Trial



Figure 4. Percentage of improvement in functional limitation by tertiles of fat loss and muscle gain. Percentage improvement in functional limitation according to tertiles of skeletal muscle and total fat loss (A) and abdominal fat loss (B). Tertiles of fat loss (total and abdominal) and skeletal muscle gain were independent predictors of improvement in functional limitation ($P \le .001$ for trend).

Davidson et al. Arch Intern Med 169(2): 122-131, 2009.

Decrease Abdominal Fat and Increase Skeletal Muscle Associated with Improvement in Functional Capacity



Principal Finding



150 minutes of weekly exercise

Reduction of abdominal and visceral fat Increase in skeletal muscle mass Improvement in insulin resistance Improvement in cardiorespiratory fitness

Balanced diet, exercise, no weight loss

Davidson et al. Arch Intern Med 169(2): 122-131, 2009.

SUMMARY

Physical Activity and Public Health in Older Adults: Recommendation from the American College of Sports Medicine and the American Heart Association

MIRIAM E. NELSON^{1,2}, W. JACK REJESKI³, STEVEN N. BLAIR⁴, PAMELA W. DUNCAN⁵, JAMES O. JUDGE^{6,7}, ABBY C. KING⁸, CAROL A. MACERA⁹, and CARMEN CASTANEDA-SCEPPA^{2,10}

AHA and ACSM advocate that regular physical activity is essential for healthy aging. That older adults engage in both exercise modalities to reduce the risk factors for chronic disease and disability.

MSSE 39:(8) 1435-1445, 2007.

Canada's Physical Activity Guides

Canadian Physical Activity Guidelines

FOR OLDER ADULTS - 65 YEARS & OLDER

Guidelines

To achieve health benefits, and improve functional abilities, adults aged 65 years and older should accumulate at least 150 minutes of moderate- to vigorousintensity aerobic physical activity per week, in bouts of 10 minutes or more.

It is also beneficial to add muscle and bone strengthening activities using major muscle groups, at least 2 days per week.

Those with poor mobility should perform physical activities to enhance balance and prevent falls.

More physical activity provides greater health benefits.

Let's Talk Intensity!

Moderate-intensity physical activities will cause older adults to sweat a little and to breathe harder: Activities like:

- Brisk walking
- Bicycling

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Vigorous-intensity physical activities will cause older adults to sweat and be 'out of breath'. Activities like:

- Cross-country skiing
- Swimming

Being active for at least **150 minutes** per week can help reduce the risk of:

- Chronic disease (such as high blood pressure and heart disease) and,
- Premature death
- And also help to:
- Maintain functional independence
- Maintain mobility
- Improve fitness
- Improve or maintain body weight
- Maintain bone health and,
- Maintain mental health and feel better

Pick a time. Pick a place. Make a plan and move more!

- Join a community urban poling or mall walking group.
- ☑ Go for a brisk walk around the block after lunch. ☑
- Take a dance class in the afternoon.
- ☑ Train for and participate in a run or walk for charity!

Take up a favourite sport again. Be active with the family! Plan to have "active reunions".

- Go for a nature hike on the weekend.
- charity! I Take the dog for a walk after dinner.

Now is the time. Walk, run, or wheel, and embrace life.



Canadian Society for Exercise Physiology ; www.csep.ca

Rethink your Treatment Targets

For management of obesity and related health risk, we must look beyond weight loss as the only indicator of therapeutic/treatment success.



For Reducing Obesity and Related Health Risk, Exercise Without (minimal) Weight Loss is Not a Failure

Ross et al. Ann Intern Med (2001); Ross et al. Obesity Research (2004)



Importance of Self-Monitoring – Role for Pedometers

Accumulate 15-30 minutes per day



2000 extra steps / day

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